

A NEW MARINE GENUS AND SPECIES OF THE *NUUANU*-  
GROUP (CRUSTACEA, AMPHIPODA) FROM THE  
YUCATAN PENINSULA

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Our colleague, Dr. E. L. Bousfield, National Museum of Canada, is in the process of dividing the Gammaridae (*sensu lato*) into many new families and superfamilies. We believe that the 4 genera, *Gammarella* Bate, 1857 (= *Pherusa* Leach, homonym Polychaeta, = *Pherusana* J. L. Barnard, 1964), *Nuuanu* J. L. Barnard, 1970, *Cottesloe* J. L. Barnard, 1974, and *Tabatzius*, new genus (described below), comprise a group distinguished by the miniaturized uropod 3, the serrate ventral margin on article 2 of pereopods 5-7, the unusual shield-shaped article 2 of pereopod 7, the form of teeth and spines on urosomites 2-3, and the oddly geniculate antenna 1.

The *Nuuanu*-Group of Genera

*Diagnosis*.—Uropod 3 miniaturized, of parviramus form but shorter than uropod 2, inner ramus shortened and scalelike, outer ramus in primitive genera greatly longer than inner ramus and bearing distinct article 2, but in advanced genera also becoming reduced and article 2 becoming vestigial or ?absent. Antenna 1 geniculate between articles 1-2, occasionally between articles 2-3. Article 2 of pereopod 7 much broader than on pereopods 5-6, bearing either large posterior serrations or small ventral serrations, or of expanded nasiform shape. Simple gills present on coxae 2-6. Lower lip lacking inner lobes. Inner plates of maxillae 1-2 densely setose medially. Gnathopod 2 dimorphic; male gnathopod 2 enlarged, article 6 very large, longer than article 5, palm and posterior margin confluent, bearing dense medial fuzz or tufts of elongate setae, dactyl curving to fit posterior margin; female gnathopod 2 small; gnathopod 1 of both sexes with medial fuzz or scales on articles 4-5; female gnathopod 2 with fuzz or scales medially on articles 2-6. Pleon dorsally smooth or toothed, urosomites 2-3 each bearing dorsolateral tooth on each side with attendant spine. Uropod 1 with basofacial spine on peduncle.

*Etymology*.—A familial name characterizing this group may be taken from the second described genus in the complex owing to the similarity between *Gammarella* Bate, 1857, and *Gammarellus* Herbst, 1793. The latter name undoubtedly will be used as root for a new name of the family-group in revisions being undertaken by our colleagues. Both names are valid according to ICZN 56a.

*Relationship*.—Taxa of the *Nuuanu*-group have the thick-bodied appear-

ance of those in the *Elasmopus*-group but differ strikingly in uropod 3 which is of melitid form, basically parviramus but miniaturized, and more primitive than that found in many species of *Melita* Leach owing to the well developed article 2 on the outer ramus, characteristic of certain other genera such as *Eriopisa* Stebbing, *Ceradocopsis* Schellenberg (= *Maeracunha* Stephensen) and *Metaceradocoides* Birstein and Vinogradova. The latter genus may actually be related to *Bathyceradocus* Pirlet, which must be segregated from other marine amphipods because of the coxal gill on pereonite 7, and which may have affinities with another marine group typified by *Anisogammarus* Derzhavin. The lack of inner lobes on the lower lip of the *Nuuanu*-group distinguishes it from most other marine amphipods lacking gill 7 except for the Hadziidae (see Zimmerman and Barnard, 1977), a family composed of *Hadzia* Karaman, *Dulzura* J. L. Barnard, and *Protohadzia* Zimmerman and Barnard (1977).

The Hadziidae have been distinguished from the Melitidae by Zimmerman and Barnard (1977) by loss of the palm on female gnathopod 2. The weckeliid genera have been removed from the Hadziidae and differentiated from both Melitidae and Hadziidae by the enfeebled gnathopod 2 bearing evenly distributed spines on the palm. Weckeliids differ from Hadziidae also in the aequiramus uropod 3 lacking article 2 on the outer ramus (see Zimmerman and Barnard, 1977, for terms).

One might conceive that *Dulzura* J. L. Barnard, in the Hadziidae, and *Cottesloe* J. L. Barnard in the *Nuuanu*-group could have had a common ancestor. In other respects the *Nuuanu*-group may be closer to hadziids than is apparent from the gross external appearance. Hadziids are an incipient interstitial group with thin bodies, no eyes and no pigment (except *Protohadzia* Zimmerman and Barnard, 1977). The *Nuuanu*-group have stout, *Elasmopus*-like bodies with stout appendages, but are probably almost pigmentless and the eyes in most species have few ommatidia. One species has been found in dimly lit anchialine waters of Hawaii (Barnard, in press). Both groups are therefore preadapted for lightless environments, though neither has been found in the deep sea and both occur in shallow water when marine.

The *Nuuanu*-group is very close to *Ceradocopsis* Schellenberg (= *Maeracunha* Stephensen) which also has miniaturized uropod 3, similar lower lip, and similar gnathopods, but the *Nuuanu*-group has article 2 of pereopod 7 broadly expanded and hatchet shaped.

The retention of medial setae on the maxillae distinguishes the *Nuuanu*-group from the *Elasmopus*-group of genera, which, broadly conceived, would include *Parelmopus* Chevreux, *Mallacoota* J. L. Barnard, *Ifalukia* J. L. Barnard and *Beaudettia* J. L. Barnard. A tendency to reduction of the inner ramus of uropod 3 occurs in *Elasmopus*, and this is carried to the parviramus extreme in the aberrant *Beaudettia*. *Elasmopus*- and *Nuuanu*-

groups might conceivably have a common ancestor in the morphological grade represented by *Ceradocopsis*.

The *Eriopisella*-group has reduced maxillary setation and severely reduced gnathopod 2 approaching the classification "mitten-shaped." The separation of the *Nuuanu*-group from other marine gammarids is therefore very strong and worthy of nomenclatural recognition.

#### Classification in the *Nuuanu*-group

An opportunity to examine one specimen of *Gammarella fucicola* (Leach), see below, reveals the extreme closeness of *Gammarella* and *Cottesloe* J. L. Barnard, 1974. In the following key an attempt to distinguish them is made, but the diversity between the 2 known Australian species of *Cottesloe* is greater than between the type-species of *Cottesloe*, *C. berringar*, and *Gammarella fucicola*. There may be reason to separate the second species of *Cottesloe*, *C. merringanee*, into a third genus or simply to combine all into an amended *Gammarella*. This latitude could be extended to admit *Nuuanu* into the expanded genus also. Until more exploration of warm waters is completed and more species of the complex discovered we maintain the genera in the following key.

#### Key to Genera and some Species of the *Nuuanu*-group

- |   |                              |
|---|------------------------------|
| 1. Maxilla 1 styliform  | <i>Tabatzius</i>             |
| Maxilla 1 not styliform   | 2                            |
| 2. Urosomite 1 with dorsal tooth or process   | 3                            |
| Urosomite 1 smooth dorsally   | 4                            |
| 3. Article 2 of antenna 1 about 1.25 times as long as article 4 of antenna 2, cuticle covered with straw setules                                | <i>Gammarella fucicola</i>   |
| Article 2 of antenna 1 about 1.05 times as long as article 4 of antenna 2, cuticle naked  | <i>Cottesloe berringar</i>   |
| 4. Article 2 of antenna 1 about 0.8 times as long as article 1 of antenna 1, cuticle naked, pleonites 1-3 with dorsal tooth                     | <i>Cottesloe merringanee</i> |
| Article 2 of antenna 1 about 0.55 times as long as article 1 of antenna 1, cuticle covered with straw setules, pleonites 1-3 untoothed dorsally | <i>Nuuanu</i>                |

#### *Tabatzius*, new genus

*Diagnosis*.—Nuuanuid with styliform outer plate and palp of maxilla 1, article 1 of palp elongate; mandibular lobes of lower lip elongate, apically curled; lobes of telson with deep apical notch; head with mammilliform lateral lobe defined by weak notch; uropod 3 with outer ramus longer than peduncle, distinctly 2-articulate, inner ramus short and scalelike.



*Type-species.*—*Tabatzius copillius*, new species.

*Etymology.*—Derived from Mayan words, "Tabatzi," morning star; "copilli," wedge-shaped. Gender masculine.

*Relationship.*—This genus is characterized by the remarkable styliform maxilla 1 and the elongate and curled mandibular lobes of the lower lip. There is a possibility that the species of *Nuuanu*, the most similar genus, will have to be segregated generically in the future but *Tabatzius* can be distinguished from the 3 known species of *Nuuanu* by the first maxilla and lower lip. No other member of the *Nuuanu*-group has deeply notched telsonic lobes, although several species such as *Cottesloe berringar* have weakly excavate apical margins. The head in this group varies in the angularity or roundness of the ocular lobe and this may have future value at the generic level. We suspect that the 2 species of *Cottesloe* may be distinct generically owing to differences in epimera 1-2, teeth on article 2 of pereopods 5-7, and teeth on pleonites.

*Gammarella*, as depicted by Della Valle (1893), and Chevreux and Fage (1925), has normal mouthparts but very weakly toothed second articles on pereopods 5-7 and an unusual male uropod 3 with reduced article 2 on the outer ramus. It must be reexamined to determine whether or not uropod 3 is similar to that of *Cottesloe berringar* (see below). Gnathopod 2 of the male also has an unusually long dactyl and an unusual cluster of basal setae on article 6.

*Tabatzius* has an unusual female gnathopod 2. It is larger and more distinct from gnathopod 1 than in females of other species in the family.

*Tabatzius copillius*, new species

Figs. 1-3

*Description of male.*—Lateral lobe of head mammilliform, anteroventral notch weak; eyes with numerous but dispersed ommatidia, all circular, none bigeminal. Article 1 of antenna 1 with distoventral spine, accessory flagellum 3-articulate, primary flagellum with 11 articles, as long as peduncle. Articles 4 and 5 of peduncle on antenna 2 of equal length; flagellum with 6 articles, about 1.4 times as long as article 5 of peduncle. Right lacinia mobilis with 3 prongs, one of these short; right rakers 8, left rakers 8, one setule between each pair of rakers; palp rather short and stout, ratio of lengths of articles 1,2,3 = 27:53:44, article 2 with only 1 stout inner apical spine, article 3 scarcely falcate, inner apical spines inserted basally to mark 45. Lower lip elongate proximally to distally; mandibular lobes strongly extended, thin, curled apically, with ridge ending in lobe on each side proximal to curled lobe of tip. Inner plate of maxilla 1 thin, with mediofacial setose ridge and apical extension free of setae; outer plate and palp styliform, extremely elongate, thin; outer plate with 3 stout apical

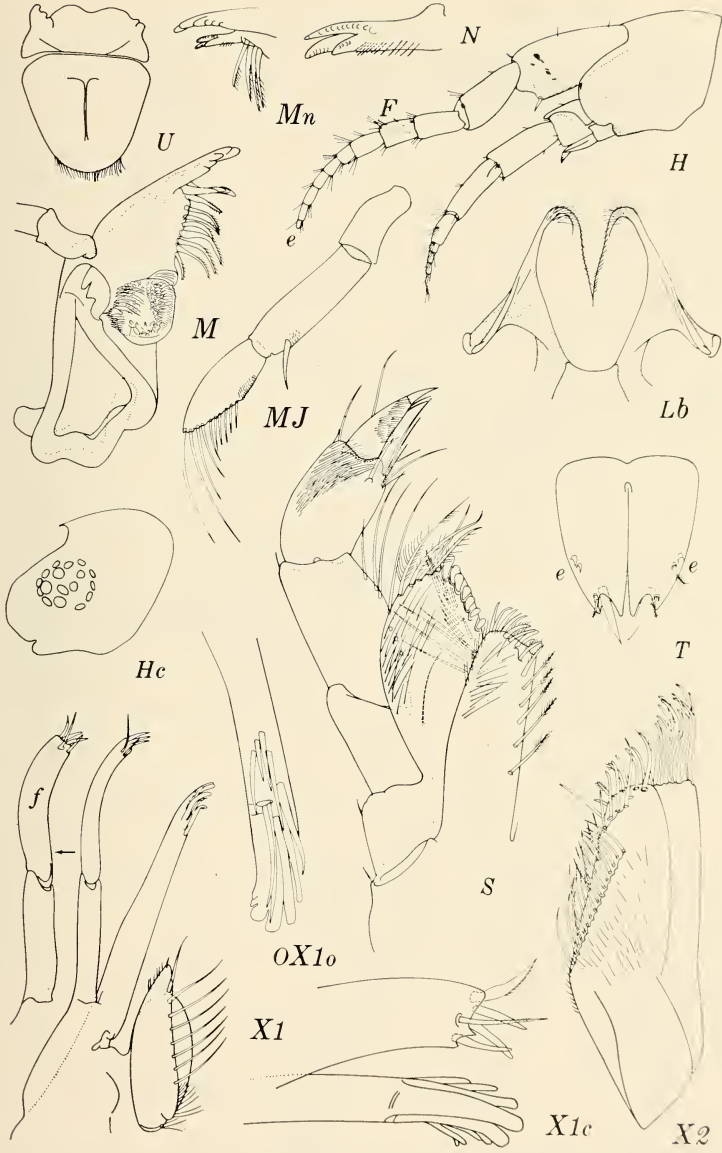


Fig. 1. *Tabatzius copillius*, new genus, new species, holotype, male "a"; b = male "b"; c = female "c." A, antenna; C, coxa; D, dactyl of pereopod; E, epimeron(a); F, accessory flagellum; G, gnathopod; H, head; I, inner ramus or plate; J, palp; K, cuticle; L, lower lip; M, mandible; N, right lacinia mobilis; O, outer plate or ramus; P, pereopod (3-7); R, uropod; S, maxilliped; T, telson; U, upper lip; W, pleon; X, maxilla; e, broken or absent; f, flattened; i, medial; n, right; o, opposite; s, setae removed; v, ventral.

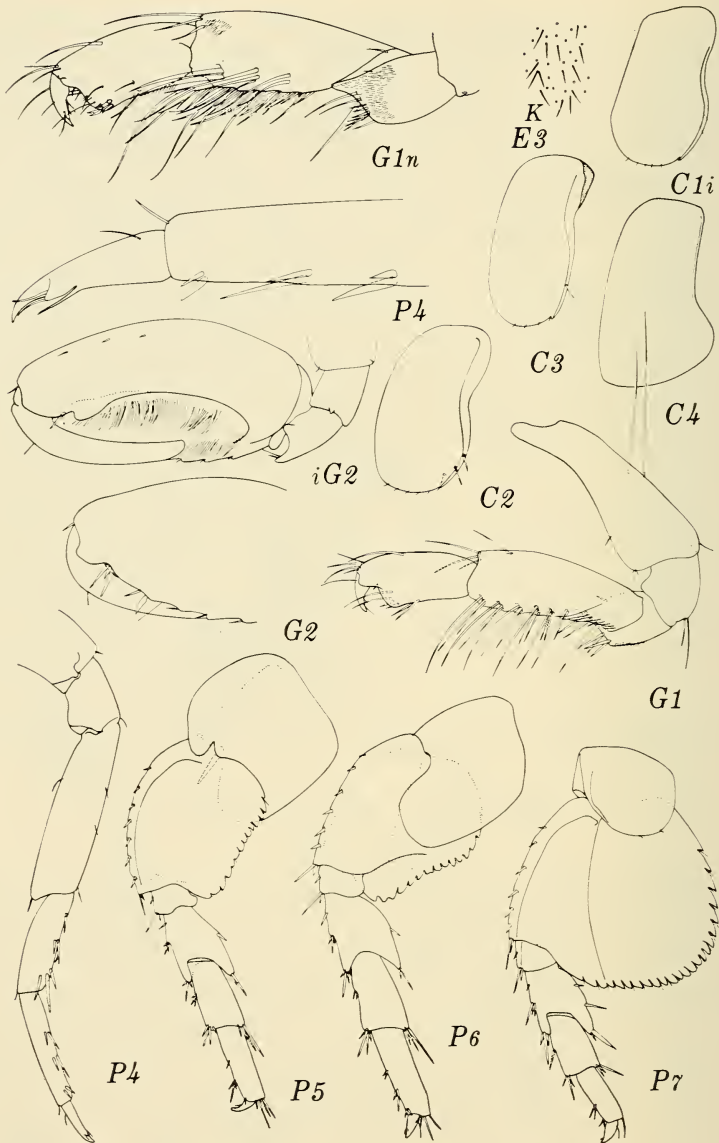


Fig. 2. *Tabatzius copillius*, new genus, new species, holotype, male "a." See Fig. 1 for legend.

spines, medialmost with 2 inner humps and notches, 2 additional free apical spines, 6 other thin inner facial spines, some dispersed towards base; palp 2-articulate, article 1 elongate, article 2 about 1.2 times as long as article 1, apex with tooth, bearing 4 apical spines, 1 of these pointing somewhat

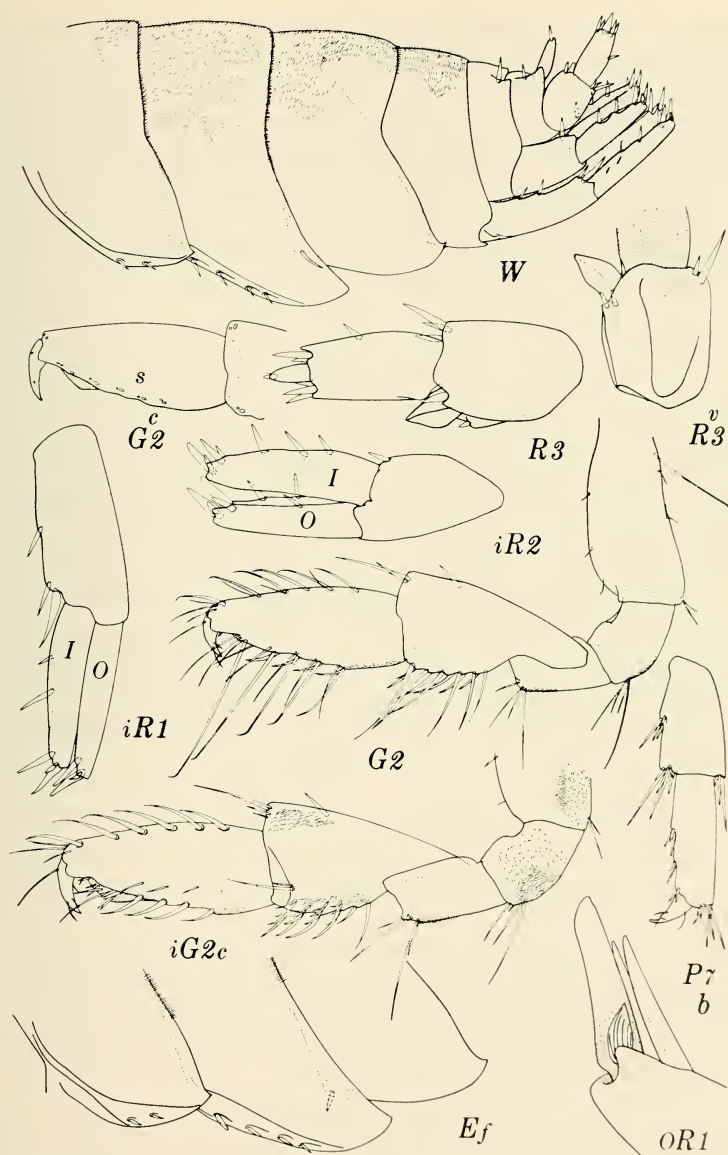


Fig. 3. *Tabatzius copillius*, new genus, new species, holotype, male "a"; b = male "b"; c = female "c." See Fig. 1 for legend.

laterally, plus 1 stiff subapical seta. Maxilla 2 very thin; outer plate much narrower than inner plate, almost rectangular in apical part. Coxae 1-3 with small posterodistal tooth, coxae 1-2 with 2 posterior spines, coxa 3 with 1 posterior spine, posteroventral lobe of coxa 4 almost fully rounded.



Long posterior setae on article 2 of pereopods 1-4 = 2-1-1-1, short posteriors = 1-0-4-2, long anteriors = 0-0-1-1, short anteriors = 2-0-3-1. Palm of gnathopod 1 oblique; article 2 expanding distally; article 3 not elongate; article 4 with 1 long and 6 medium to short posterior spines from lateral view, with medial fuzz and additional posterior spines; article 6 with only 1 anterior subapical seta, mediofacial setal groups highly posterior. Tooth on article 4 of gnathopod 2 strong, thin, pointing distalwards; posterior margin of article 6 with 3 notches each bearing setule but otherwise lacking long setae, fuzz on mediofacial hollow very sparse, anterofacial margin with only 3 short setae in tandem, distal part of ridge defining hollow with hump, and 2 spines distalwards from hump, lateral palmar margin with only 5 spines in groups of 3,1,1. Pereopods 3-4 alike; main dactylar seta almost fully fused to body of dactyl, posterior margin otherwise naked; coxa 5 with distomedial spine. Pereopods 5-7 short; posterior margins of article 2 fully toothed, teeth enlarged. No pereonite or pleonite with dorsal tooth; epimeron 1 with small posteroventral tooth and 2 anterofacial spines; epimeron 2 strongly extended posteroventrally, with sharp but stout posteroventral extension, ventral face with 4 spines; epimeron 3 with small to medium posteroventral tooth, anteroventral corner with spine. Urosomites 2-3 with dorsolateral tooth bearing spine on each side. Peduncle of uropod 1 with 1 small apicodorsal spine and special enlarged spine set more ventrally, dorsal margin with 2 spines set proximally, dorso-medial margin with 1 large special spine and 2 smaller dorsal spines set apicalwards; outer and inner rami with 2 dorsal spines. All rami of uropods 1-2 with 5 apical spines, comprising 1 large apical nail, 2 large accessory spines, and 2 small striate falcate spines, 1 of these on each side of apical nail, pair of large accessory spines on uropod 2 of diverse sizes. Peduncle of uropod 1 with 1 subapical dorsolateral spine, medial apex with 1 small spine; outer ramus with 2 dorsolateral spines, 1 dorsomedial spine; inner ramus with 3 dorsal spines. Inner ramus of uropod 3 small and scalelike, naked; outer ramus 1.2 times as long as peduncle, article 1 of outer ramus with 1 lateral spine. Telson somewhat elongate, ratio of width to length 27:31; apices narrow, deeply bifid, each with elongate spine inserted into notch plus short adjacent lateral setule, pair of dorsolateral setules on each side near mark 60. Cuticle covered densely with pores, often pores with attached short spicules but most spicules apparently abraded and absent.

*Description of female.*—Gnathopod 2 distinctive, thin but not like gnathopod 1; article 4 lacking posterodistal tooth, bearing brush of distal setae, naked on posterior margin; article 5 expanded, especially broad distally, posterior margin strongly bulging, anterior margin with 1 spine subapically; article 6 as long as article 5, somewhat more ovate than in other species of family, palm oblique but defined by precise angle, bearing pair of defining spines, 1 on each face, medial surfaces of articles with patches



of ornamentation, either fuzz composed of elongate scales, or tiny buttons appearing as truncate villi, as follows: article 2 with distal scale fuzz, articles 3 and 4 with villose fuzz, article 5 with anterior and posterior patches of scale fuzz, article 6 with posteroproximal patch of scale fuzz.

*Variations.*—Three males and 1 female known. Female larger and better developed than males, with more numerous spines on pereopods 5–7, generally more serrations on article 2 of pereopods 5–7, ridge on coxa 5 half as long as in male. Primary flagellum of antenna 1 with 14 articles; flagellum of antenna 2 with 10 articles; facial clump on article 1 of antenna 1 reduced to 4 setules. Maxillae more setose than in males. Inner ramus of uropod 1 with 3 dorsal spines; outer ramus of uropod 2 with 3 dorsal spines, inner with 4; lateral apex of peduncle on uropod 3 with 4 spines.

Male “b” better developed than holotype male. Primary flagellum of antenna 1 with 11 articles (broken in holotype). Coxa 1 with 3 posterior spines, posterior margin of article 5 on gnathopod 1 with 7 rows of spines, coxa 5 with 3 posterior setules and slight notch (absent on holotype), article 2 of pereopod 6 with 18 serrations but article 2 of pereopod 7 with only 22 serrations. Outer ramus of uropod 1 with 3 dorsal spines.

*Notes on illustrations.*—Eyes not drawn on head of holotype, see female head for eyes. Apex of antenna 1 broken (see description of male “b” for proportions). Left pereopod 7 with article 6 stunted (see enlarged drawing of male “b”). Epimera of pleon drawing unflattened (see additional drawing of flattened epimera). Telson with several missing setules marked with sockets.

*Holotype.*—USNM 154430, male “a” 3.22 mm (illustrated).

*Type-locality.*—Smithsonian-Bredin 1960 Expedition, Sta. 52-60: 10 April 1960, Ascension Bay, Quintana Roo, Mexico, just behind center of Nicchehabin Reef, E of Allen Point, 1–5 ft, on coral and under coral pieces on bottom.

*Paratypes.*—Female “c” 3.68 mm (illustrated), from type-locality. Male “b” 3.30 mm (illustrated), and male “d” 2.30 mm, from Smithsonian-Bredin 1960 Expedition Sta. 95-60: 19 April 1960, Ascension Bay, Suliman Point to 300 yds to SW shore and reef flats to sand flats, 5 ft.

### *Gammarella fucicola* (Leach)

*Pherusa fucicola* Leach, 1814:432; Stebbing, 1906:449–450; Chevreux and Fage, 1925:247–248, figs. 258, 259.

*Melita fucicola.*—Sovinsky, 1898:486–489, pl. 11, figs. 10–19, pl. 12, figs. 1–4.

*Material.*—USNM 172342, female 8.5 mm, Cap Coz, Finistère, Brittany, France, 23 August 1945, from seaweed, Andrew D. Pizzini.

*Remarks.*—Except for Sovinsky’s fine portrayal of this species, the illustrations and descriptions appear to be erroneous in several respects. The

characteristics of head, antenna 1 and uropod 3 fit the *Nuuanu-Cottesloe-Tabatzius* concept much closer than heretofore known. Although article 2 of antenna 1 is elongate it forms a geniculation with article 1, while article 3 also folds in an opposite manner as in the other genera. The head is similar to *Nuuanu amikai* J. L. Barnard, 1970, and not as shown by Chevreux and Fage (1925), who overlooked the notch and accessory lobe covering the base of antenna 2. Uropod 3 of our female is like that of *N. amikai* in the well developed article 2 of the outer ramus and in general proportions of the outer and inner rami, in contrast to the illustration of both Della Valle and Chevreux and Fage. Perhaps male uropod 3 changes to the form shown by Chevreux and Fage. The cuticle is covered with straw-setules; each side of urosomites 1-2 has a dorsal spine and quadrately extended tooth as in other species of the family. Uropod 1 has a large fully apical spine on each side of the peduncle as in *Cottesloe berringar*.

The medial pattern of fuzz-setules on male gnathopod 2 shown by Della Valle (1893) and Chevreux and Fage (1925) may be a generic distinction between *Gammarella* and *Cottesloe*.

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#### Literature Cited

- Barnard, J. L. 1964. Revision of some families, genera and species of gammaridean Amphipoda. *Crustaceana* 7:49-74, tables 1-2.
- . 1970. Sublittoral Gammaridea (Amphipoda) of the Hawaiian Islands. *Smithsonian Contributions to Zoology* 34:286 pp., 180 figs.
- . 1974. Gammaridean Amphipoda of Australia, Part II. *Smithsonian Contributions to Zoology* 139:148 pp., 83 figs.
- . in press. The Cavernicolous fauna of Hawaiian lava tubes 9. Amphipoda (Crustacea) from brackish lava ponds. *Pacific Insects* 17.
- Bate, C. S. 1857. A synopsis of the British edriophthalmous Crustacea. *Annals and Magazine of Natural History, series 2*, 19:135-152, figs. 1-2.
- Chevreux, E., and L. Fage. 1925. Amphipodes. *Faune de France* 9:488 pp., 438 figs.
- Della Valle, A. 1893. *Gammarina del Golfo di Napoli. Fauna and Flora des Golfes von Neapel* . . . *Monographi* 20:xi + 948 pp., atlas of 61 plates.
- Herbst, J. F. W. 1793. *Garneelasseln. Onisci gammarelli. Part 6 in: vol. 2 of "Versuch einer Naturgeschichte der Krabben und Krebse nebst einer systematischen Beschreibung ihrer verschiedenen Arten"* :105-146 [pls. 34-36, not seen], Berlin und Stralsund.
- Leach, W. E. 1813/14. *Crustaceology. Appendix. Edinburgh Encyclopaedia*, 7: 429-437.
- Sovinsky, V. K. 1898. *Vyshshia rakoobraznyia (Malacostraca) Bosfora, po materialam*

sobrannym d-rom A. A. Ostroumovym v 1892 i 93 gg. Zapiski Kiev. Obshchestva 15:447-518, pls. 8-13.

Stebbing, T. R. R. 1906. Amphipoda I. Gammaridea. Das Tierreich 21:1-806, figs. 1-127.

Zimmerman, R. J., and J. L. Barnard. 1977. A new genus of primitive hadziid (Amphipoda) from Puerto Rico. Proceedings of the Biological Society of Washington 89(50):565-580, figs. 1-5.

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